EARTH SCIENCES (EAR)

EAR 100. Physical Geology. (3 Units)
Prerequisite: Concurrent enrollment in EAR 101 is recommended. Volcanoes, earthquakes, oceanic processes and continental drift. Rock and mineral identification is enhanced by concurrent enrollment in EAR 101. Meets certain general studies requirements, is fundamental to the Geology major, and has wide-ranging applications in art, commerce, public policy, and science. Field Trip.
Offered Fall, Spring

EAR 101. Physical Geology Laboratory. (1 Units)
Prerequisite: Concurrent enrollment in EAR 100 is recommended. Nature and origin of rocks and minerals through determination of physical properties of specimens. Topographic and geologic map analysis. Geological features from stereoscopic air photos. Recommended elective for students interested in the outdoors, archaeology, mineral deposits, land use, and natural hazards.
Offered Fall, Spring

EAR 200. Earth History & Evolution. (3 Units)
Prerequisite: EAR 100, EAR 101, and concurrent enrollment in EAR 201. Geological and biological history of the earth. Includes development of the geologic time scale, origin of the Earth and life, the fossil record and evolution, and plate tectonics. Special emphasis on the geology of North America. Philosophical implications make this a valuable general elective for all students.
Offered Spring even

EAR 201. Earth History Lab. (1 Units)
Prerequisite: Concurrent enrollment in EAR 200. Practical laboratory experience in fossil identification. Life history, form, function and evolution of animals and plants important in the fossil record. Interpretation of geologic maps and stratigraphic correlation of sedimentary rocks. Three hours of laboratory per week.
Offered Spring even

EAR 312. Natural Disasters. (3 Units)
Prerequisite: Completion of lower division General Education. Examines the impact of natural events on human activities and vice versa. Mankind's uneasy relationship with atmosphere, oceans and not-so-solid Earth. Examines the study of earthquakes, volcanoes, floods, landslides, tsunamis, climate change, hurricanes, tornadoes, and wildfires.
Offered Fall, Spring, Summer

EAR 370. The World Ocean. (3 Units)
Prerequisite: EAR 100 or GEO 200 is recommended. Physical and chemical characteristics of seawater. Distribution of temperatures and salinity. Study of currents, tides, waves and the influence of the sea on weather and on life.
Offered Spring odd

EAR 376. Field Mapping. (3 Units)
Introduction to geological and environmental field mapping. Techniques include working wih topographic maps and remotely-sensed images, use of Brunton compass traverse methods, and interpretation of sedimentary rocks and geological structures (faults, folds). Applications to geotechnical work, resource management, environmental analysis, anthropology, government agencies, industry, and teaching outdoor activitites. Eight hours of laboratory and one-half hour of lecture per week.
Offered Spring even

EAR 410. Environmental Geology. (3 Units)
Study of human interaction with the geologic environment. Mitigating exposure to geological hazards (earthquakes, volcanic eruptions, landslides); environmental consequences of geological resource (fossil fuels, minerals, water) extraction and consumption; surface and groundwater contamination; acid rain; climate change; waste burial.
Offered Spring odd

EAR 416. Earth Sciences for Teachers. (3 Units)
Prerequisites: Completion of lower division General Education. Study of planet Earth including such topics as geology, volcanoes, earthquakes, fossils, oceanography, weather, and astronomy as appropriate for elementary and junior high school teachers. Two hours of lecture and three hours of laboratory per week.
Offered Fall, Spring, Summer

EAR 450. Plate Tectonics and the Rock Cycle. (4 Units)
Study of plate tectonic processes and how they relate to the formation of rocks and the rock cycle. Includes earthquakes, volcanic activity, hot spots and plate bandary types.
Offered Fall even

EAR 460. Global Change. (3 Units)
An interdisciplinary introduction to the science of understanding global change natural as well as anthropogenically induced. Key topics include the physical climate system and its variability, the carbon cycle, land and water issues, and the impact of global change on society.
Offered Fall even

EAR 476. Groundwater. (3 Units)
Prerequisites:Â EAR 100 and EAR 101.Â CHE 108 or CHE 110 is recommended. Interrelationships of geologic materials and processes with water. Topics include: hydrologic cycle, physical characteristics of aquifers, groundwater flow, wells, geology of flow systems, groundwater chemistry, and criteria for development and management of water resources.
Offered Fall even

EAR 478. Engineering Geology. (3 Units)
Prerequisite: EAR 450. Evaluation and abatement of geologic hazards affecting construction projects and land use. Landslides, groundwater pollution, subsidence, flooding, and earthquake effects. Mechanical properties of rocks and soils. Case histories and site investigations. Application to business, law, construction engineering and environmental studies. Two hours of lecture and three hours of laboratory per week.
Offered Infrequent

EAR 490. Sr Sem In Earth Sciences. (1 Units)
Prerequisite: Senior standing in Earth Sciences or consent of instructor. Study and discussion of current research in Earth Sciences. Techniques of oral presentation, library research and preparation of audiovisual materials. One hour of seminar per week.
Offered Infrequent

EAR 494. Independent Study. (1-3 Units)
Prerequisite: Consent of instructor. Independent Study of a particular geographic or environmental problem under the supervision of a member of the Geography staff.
Offered Fall, Spring

EAR 495. Advanced Top In Ear Sci. (3 Units)
Selected topics in Earth Science with course content to be determined by instructor. Repeatable course.
Offered Spring

EAR 496. Internship In Earth Sci. (1-3 Units)
Prerequisite: Consent of instructor. Employment as an assistant or volunteer in an earth sciences-related firm or government agency. Course may run at time convenient to student and employers, including summer. Student should contact Department faculty three months prior to enrollment. CR/NC grading. Repeatable course.
Offered Fall, Spring

EAR 498. Directed Research. (1-3 Units)
Prerequisite: Consent of instructor. Directed research of a particular geographic or environmental problem under the direction of a member of the Earth Science staff.
Offered Fall, Spring

EAR 499. Senior Thesis. (2 Units)
Prerequisite: Approval of instructor. Geological research and writing of a thesis. Generally includes library, field and laboratory investigations. Topic of research to be approved and directed by an instructor. CR/NC grading.
Offered Infrequent